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DEVELOPING WORKER ENGAGEMENT MATURITY MODEL FOR IMPROVING OCCUPATIONAL SAFETY AND HEALTH (OSH) IN CONSTRUCTION

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Research on Worker Engagement (WE) has identified the increased importance of meaningful discussion, communication, knowledge sharing, and shared decision-making regarding Occupational Safety and Health (OSH) practices within the construction industry. This paper reports on initial findings on the development of a meaningful discussion framework for improving OSH and engagement of the construction workforce. The main purpose of the framework is to rank levels of discussions amongst construction operatives and supervisors relevant to positive performance at work and enhancement of OSH. This reflects the legal and ethical requirements for management to collaborate with the construction workforce for the improvement of OSH. For effective WE in OSH to become the norm, the effectiveness of corporate OSH engagement programmes needs to be assessed using a valid and reliable tool. Also, there is a need for a practice-driven and validated Worker Engagement Maturity Model (Meaningful Discussion Framework) that not only identifies and aligns with existent organisational capabilities, as shown in the HSE Leadership and Worker Involvement research, but addresses a set of dimensions specifically targeted at the construction workers. The methods used to develop the framework discussed here involved qualitative interviews to gain accounts of episodes of worker engagement, which were categorised using Nvivo, and ranked based on feedback from expert focus groups. The 'Meaningful Discussion' Framework highlights the links that higher levels of worker and organisational maturity can have in relation to higher levels of construction OSH performance. This is based on a number of logically progressive worker maturity levels where higher levels build on the requirements of already existing levels; from discussing issues affecting individual worker to issues that affect other workers and eventually to those 'beyond the site gate' such as design processes. Final validation testing of the model will be reported at a later date.

Keywords: Worker engagement, meaningful discussion, operatives, supervisors

INTRODUCTION & BACKGROUND

The construction industry is one of UK's most important economic sectors with 2.1 million jobs or 6.2% of the UK population employed in construction jobs, (Rhodes 2015). The industry has realised that managing people and their behaviours is a core success for better work-related performance and higher output. Managers have realised that employees are key factors that constitute the base of their accomplishments. Thus, engaging employees at work is an important element for the success of the industry and

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improving all the outcomes that leads to this success (Bakker & Demerouti 2008; MacLeod & Clarke 2009).

The concept of worker engagement was originally defined by Cameron et al. (2006) as a process where every worker on a construction site actively participates in improving health and safety by influencing others. More specifically, workers are keen to share their experiences and knowledge with other workers and managers; managers positively encourage worker participation to identify and resolve health and safety problems, and everybody on site benefits from safer working conditions. HSG263 guidance (HSE 2015) identified worker engagement as a consultation process where management give information to the workforce (inclusive of supply chain and sub-contractors) or employees and they in turn acquire feedback from them before making decisions.

The definition developed for the research reported in this paper builds on these existing ones, but includes factors identified in literature search, which includes meaningful discussion, motivation, empowerment, commitment and trust. The current definition therefore considers worker engagement as:

"A process where every worker on a construction site is motivated and empowered to participate in improving health and safety through meaningful discussions with workers in advance of decisions being taken, influencing others, and is committed to sharing their experiences and knowledge; and managers positively encourage workers to identify and resolve health and safety problems in a culture of trust, leading to every worker on site benefiting from safe and healthy working conditions."

This also includes aspects such as the recognition of the positive influence that trained trade union safety representatives have through the exercise of their workplace rights and functions through effective consultative structures and the duty of the employer to consult with them (section 3(6) of the Health and Safety at Work etc. Act 1974).

There is little research on worker engagement specific to construction workers (operatives and working supervisors) and that is where the significance of this paper on meaningful discussion relevant to engagement lays its emphasis. Previous research has identified informal lines of communication, hazard reporting and informal disciplinary roles see (Cameron et al. 2006). Following on to the work of Cameron et al. (2006), research have identified that direct worker engagement in construction has been studied in relation to workers identifying hazards and reporting injuries and that training is paramount for meaningful discussion.

However, for meaningful discussion to take place there should be some degree of trust in management's commitment to safety and any unsettling of this trust relationship by management will potentially disrupt meaningful discussions. The views of workers related to trust in management and emotional commitment to the organisation could be assessed to measure progress in the meaningful discussion process; see (DeJoy 2005). Maloney & Cameron (2003) suggested that meaningful discussions can only take place when workers possess some elements of capability, i.e. training, experience and knowledge. Therefore, the provision of requisite training for workers and management,

especially ‘soft skills’ that are fundamental for informal communication and relevant to meaningful discussions can help in the identification of hazards, reporting unsafe conditions or near misses. This creates an opportunity for a two-way communication mechanism that is required for imparting information to workers and eliciting their own views in a structured manner (Cameron et al. 2006).

Jensen (2002) and Cameron et al. (2006) both reflected on five dimensions to workplace assessment which can serve as a guide to assessing the level of meaningful discussions:

1. The area of the issues that are covered e.g. if they are related to physical hazards or if they extend to organisational management (safety culture, i.e. how safety is managed within an organisation);
2. The objectives in developing the solutions and where they rank in the UK hierarchy of risk controls; e.g. Eliminate, Prevent, Control
3. The depth of understanding with applicability to accident causation;
4. The range of solutions presented in relation to proactive and reactive decisions;
5. The capability to transfer issues out-with the immediate chain of command e.g. workers involving senior management, plant managers, or directors.

Research has continued to highlight the advantages of developing a highly engaged workforce, and therefore, many organisations are turning to enhancing levels of engagement within their influence (Wollard & Shuck 2011). Workers that are highly engaged are involved and immersed in their jobs that they enjoy the challenge (Staples et al. 1999), lose track of time while working (Gonzalez-Roma et al. 2006), have stronger organisation commitment (Hakanen et al. 2006), expend more effort on the job and are intrinsically motivated.

The importance of meaningful discussions within the construction industry lies in the perception of its importance in predicting positive performance at work and improvement of construction Occupational Safety and Health (OSH). Most construction workers will support formal organisational goals if they understand how these goals benefit themselves, the business, their fellow workers, its customers, and society as a whole. Therefore, meaningful discussions within the construction industry can be considered as a precondition for sustainable competitive advantage and it can make the real difference for the survival of an organisation, see (Macey & Schneider 2008; Song Hoon et al. 2012).

There is also an important element of reciprocity in trust (Scholefield 2000). For workers to be engaged and to reinforce their commitment within an organisation, an employer should invest in worker’s well-being, and the workers in return would feel valued and reciprocate directly with renewed employer loyalty and by working harder and more efficiently. There are also legal and ethical requirements for management to collaborate with the construction workforce for the improvement of OSH. This study therefore considers approaches to the development of a meaningful discussions maturity framework for the construction industry. Workers that are involved in the workplace should be engaged and given the opportunity to share their own views and opinions in matters related to improvement of the workplace and performance (Hummerdal 2015). Baucus et al. (2008) identified that worker’s creativity resident in them are mostly suppressed as a result of lack of support from the management and bureaucracy.

When discussions (face-to-face) are mediated by response or feedback and have direct impact on the capabilities of workers, such discussions can be considered as meaningful. Experience shows that within the construction industry, effective meaningful discussions are wholly dependent on individuals, teams and organisations. Also, because of the transient and inter-trade nature of most construction projects, the industry is often characterised by groups of workers that are peripatetic, unacquainted, working together over a limited period of time before disbanding to work on other projects, (Dainty et al. 2006).

The notion of meaningful discussions therefore is to ensure that the flow of information is effectively managed, messages are appropriately conveyed and the worker is able to interpret and act on such information in a way that is consistent with the expected intents. Meaningful discussions is considered as a fundamentally social activity which includes engaging in conversations, listening to co-workers, networking, collecting information, and directing subordinates. Meaningful discussions will thrive better in a workplace when there are some predictive elements of co-worker knowledge, team tenure, co-worker and supervisory support, group orientation and group cohesion, see (Burt et al. 2008). A discussion that directly influences a worker's intellectual growth, learning, curiosity and engages them in productive instructional activities can be regarded as a meaningful discussion, see (Hirumi 2002).

It is also suggested that meaningful discussions nurture faster information acquisition and facilitate organisational socialisation. The work of Burt et al. (2008) shows that acquisition of information via socialisation such as induction training helps in getting to know the personal life of co-workers, their attitudes, families and interests and these are relevant in developing positive safety related attitudes, co-worker knowledge and social relationships.

OBJECTIVE

The study reported in this paper has been developing a framework against which to assess 'meaningful discussion' in relation to OSH engagement. This is only part of a wider framework being developed to encapsulate levels of worker motivation, commitment, empowerment and trust. This section of the framework will serve as a guidance tool that will be useful to workers and managers on construction sites in order to improve meaningful discussion on OSH.

METHODS, DESIGN & INTERVIEWS

The research objective dictated a qualitative approach to obtain rich data giving accounts of 'worker engagement' episodes which could also describe circumstances and context. The specific type of qualitative design implemented was the phenomenological research inquiry which describes the lived experiences of construction operatives and supervisors about the phenomenon of worker engagement as described by workers; see (Creswell 2014). This was considered most suitable for this study because the type of description articulates the experiences for several operatives and supervisors who have all experienced different types of worker engagement. Phenomenological research design is based on strong philosophical underpinnings and it involves conducting interviews, see (Giorgi 2012).

Getting access to construction operatives and supervisors was facilitated by the research Steering Group, made up of construction industry OSH experts. A purposeful sampling strategy was utilised for selecting construction sites (from house building to large scale civil engineering projects) and workers from a pool of site options available across the UK. The participants sought for the interviews were “engaged” workers and supervisors i.e. a worker described as engaged will be operatives who shows interest in health and safety issues, contributes to H&S and/or regularly attends H&S meetings; whilst a supervisor will be someone who encourages engagement and regularly discusses H&S issues with their workers.

Phenomenological studies typically involve three to 10 participants (Creswell 2014); however, this study conducted a semi-structured; face-to-face and open-ended, non-leading interviews with 29 operatives and supervisors until saturation, (Charmaz 2014). Each interview lasted an average of 40 minutes. The interview process was audio recorded with note taking on site and later transcribed. The development of the meaningful discussion framework involved using inductive and deductive logic. The inductive process involved working back and forth between the themes emerging from interviews conducted and the information from literature until a comprehensive set of themes were established (Creswell 2013). This involved collaborating and interacting with industry experts (Steering Group) via presentations and workshops in order to shape the emerging themes of meaningful discussion from the interviews. The validation of the framework and categorisations was done through workshops with members of the Steering Group iteratively. The visual representation of meaningful discussions framework was developed deductively with members of the Steering Group from the categories of information acquired from interviewing the research participants to reach a logically certain conclusion. This was considered ideal working from the more general to the more specific context of meaningful discussions based on examples.

ANALYSIS & DISCUSSION

The framework for meaningful discussions was conceived and developed by the researchers in collaboration with the industry experts. This resulted in a visual representation of factors radiating out from the individual worker, to their immediate surroundings and eventually to factors 'beyond the site gate', illustrated by a conceptual dartboard; see Table 1 & Figure 1. The significance of involving industry experts was to address complex issues of diverse views regarding assigning and categorising the levels of the different issues discussed by the workers (Fontana & Frey 1994). It was identified that meaningful discussion between workers, co-workers, supervisors and managers was dependent on the fundamental principles of trust, motivation, empowerment and commitment of the workers which are some of the key features identified in the work of Cameron et al. (2006). Table 1 outlines the development of meaningful discussion criteria that was adopted in assigning levels of issues that were frequently discussed, raised or flagged up by the workers. The criticality of the issues identified; the impact on workers; and the relative meaning of such issues such as welfare, housekeeping, hazard spotting etc. are summarised in Table 1.

Table 1: Areas of issues discussed by the workers with their levels, criticality and meaning

Level	Criticality	Meaning
1	Personal work area; housekeeping; and work environment	Hazards that directly affect/related to the worker
2	Welfare	Issues related to site welfare
3	Hazard spotting; site hazards; and hazard causes/procedures	Hazards that are associated to other workers
4	Proactive site solutions	Proactive discussions or proactive actions taken to resolve issues
5	Beyond the site gate; boardroom/other sites; designs; and mental health	Issues that are beyond the site gate needing some management interventions

Figure 1 shows the output from the workshop with industry experts. The core of the subjects discussed by the workers was central to issues of personal work area and welfare which is considered significantly important to the workers. It is only when issues related to personal work area and welfare have been addressed and there is that element of trust (Scholefield 2000) in the management to act on problems, that a worker will have the confidence to raise other immediate issues that either impact them personally or their work environment. Engaging with workers in resolving immediate issues like housekeeping, personal work area and work environment issues will reinforce some sense of empowerment, meaning, competence, impact and belief that they are being listened to (Conger & Kanungo 1988). This is when workers feel empowered and emotionally committed (DeJoy 2005; Hakanen et al. 2006; Schaufeli 2013) to identify and raise other issues that pose as hazards to others. These involve issues like hazard spotting; identifying site or work related hazards; risk assessment; accident investigation; equipment design and selecting PPE and equipment. These are more effective if involvement is on a voluntary basis as this ensures ownership (Lancaster et al. 2001). The depth of engagement and meaningful discussion depends upon a range of factors as highlighted by Jensen (2002) and Cameron et al. (2006).

The Construction Design and Management Regulations (2015) (CDM) in the UK explicitly state the requirements of those who indirectly influence site health and safety during the pre-construction, or planning stages, see (Hare et al. 2006). This requires designers to manage health and safety risks. Regulation 14 of CDM 2015 places duties on the principal contractor to consult and engage with workers in construction work to cooperate effectively in developing, promoting and checking the effectiveness of measures to ensure the health, safety and welfare of the workers. However, the issues discussed by the workers clearly identify that inherent issues related to design were not reflected in their meaningful discussions. Other issues beyond the site gate, like mental health, and boardroom level issues were not captured in the discussions that workers had. But this is hardly surprising as these are the most advanced levels of meaningful discussion and therefore will be rare until full maturity is gained.

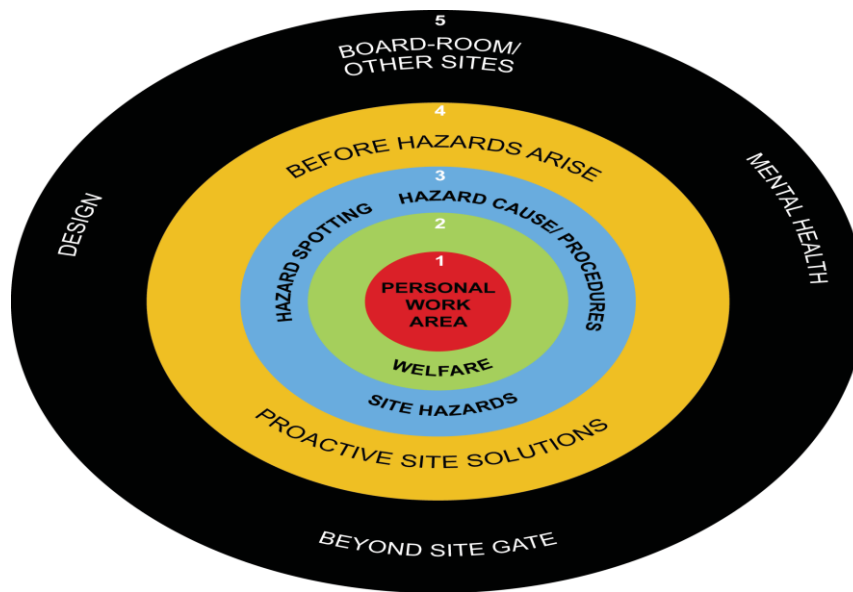
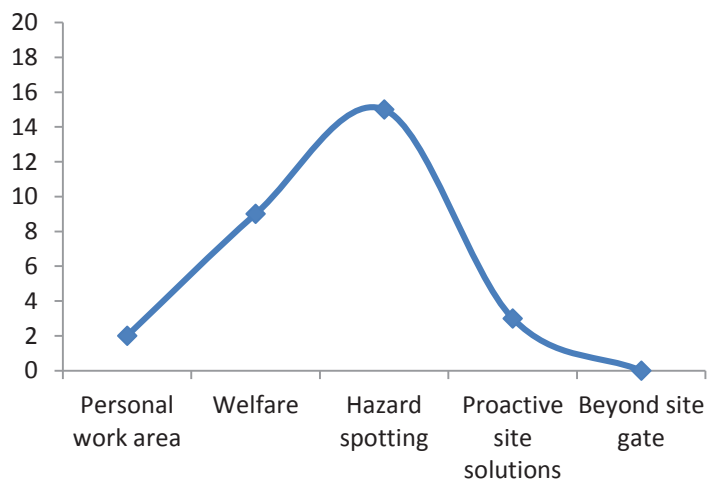


Figure 1: Conceptual Framework for Meaningful Discussions

Table 2 shows the issues that were either discussed by workers or established by the expert group, actions that were taken to resolve or mitigate the issues and the ranking of such issues. Nine of the issues discussed by the workers involved welfare (Level 1) which is considered significant to every worker on site. Two issues were related to personal work area or housekeeping (Level 2) while hazard spotting or site hazards (Level 3) accounted for fifteen of the thirty issues discussed by the workers. Three of the issues were on proactive site solutions (Level 4) and none on design, boardroom or other sites issues, family/personal issue or mental health.



CONCLUSIONS

Based on the results from this study, the level of mutual understanding between workers on construction sites as well as the close coordination and communication of design issues were lacking (beyond site gate issues). Although there seemed not be significant

barriers to communication between workers; issues that were relevant to design professionals, construction phase plan and contractors were not discussed. This gives a sense of the level of reach of the workers in terms of identifying such problems and cascading to the relevant level. From the interviews conducted, site inductions, toolbox talks and pre-start meetings were considered by the workers as a critical point for the communication of health and safety information between management and the workforce. However, the opportunities for two-way communication that relates to the mechanisms that are required to impart information to workers and elicit their views in a systematic, but not necessarily formal manner is considered still lacking. It is worthy to say that meaningful discussions are taking place but, the level of reach of such discussions need to go wider and farther than the examples shown in Table 2. For the operatives and supervisors to meaningfully discuss issues up to Level-5 of the framework, they will need to have the requisite skills, experience, competence and training. The expert group recommended further data collection from a sample of female workers and trade union Safety Representatives to ascertain if Level 5 discussions (beyond the gate) are identified.

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Level	Issues & Description	Action Examples
3	Battery charging points e.g. batteries are being charged in the canteen	Extension cables ordered and extensions delivered and now in use
2	Ear plug dispenser	Ear plug dispenser fitted to the board on the lower ground and ready for use
1	Temporary lighting	Contractor supplied task lighting but subcontractors are to supply their own if there is not enough on site
1	Housekeeping	With lots of new faces on site, people are not tidying up last 10 minutes at night. All foremen should ensure that work personnel tidy up before leaving site.
3	PPE	Everyone is not adhering to the five-point PPE rule. If the same people persistently fail to adhere to the rules, their boss will be informed to take relative actions
4	Relevant tickets for Scissor lifts	Spot checks will be carried out; charge hands are to make sure that only personnel with tickets use machines
2	No running water in joiners canteen	Supervisor to talk to subcontractor to resolve issue
4	Work plan - Plant, machinery & equipment	Everyone to be aware that the crane operator will be working closer to the building
2	Someone squatting over the toilet, broke seat and made a mess	All personnel spoken to; if for any reason you need to do this speak to management to see if alternative arrangement can be made
3	Car park mud e.g. sparks complained that the car park was very muddy and no walkway	New tar car park now in operation with walkway through the canteen
3	Mixed wastes e.g. plasterboards, timbers, and metals all mixed in the bins	Everyone told to separate waste bins provided to allow forklift driver to put waste in relative skips
3	Bottom of plant room stair has open area you need to jump over	Area was boarded over to make suitable platform
3	Stairs blocked off for pour and no dry routes to wing B	New routes with barriers and no mud designed
3	Machinery movement/awareness e.g. lots of MEWPS moving on site	Safety advisor suggested signs be made and erected for MEWP working area
2	People smoking outside building and canteen	All personnel spoken to and told to use designated smoking areas. The designated smoking area to be made larger
2	Canteen left untidy and microwave not cleaned after use	Foremen to speak to men and more bins and signs to be put up
3	PAT testing equipment	All equipment on site tested
3	Uncovered risers	Barriers erected to protect it
3	Water bottle not used during cuttings	Brickies given water bottles and they are under observation
3	COSSH bins not being used	Signs were made up and put up on site
2	No microwave in the canteen	New one was purchased and put in place
4	Commendation	Scaffolders commended for prompt action taken at east elevation scaffold
3	Fire alarm	Fire alarm did not go off with others during fire drill. Supervisor to silent test the alarm
2	Toilet water running out frequently	Signs to be put up to "pull up taps" after use; plumber to look at taps
2	Water not fit for drinking	Signs to be made to warn personnel that water from canteen sink is not suitable for drinking
2	No closer on canteen door	Supervisor will look into fitting new ones
1	Cables on ground at west wing	Cables to use nearest drop points and hung up off the floor
3	Metal cutting with jigsaw very noisy	When cutting metal (trays or ducting) with jigsaw, do it outside if possible or warn people in area before cutting. Ear plug dispenser to be put up on site for easy access
3	Using other workers platforms without charging after use	All team members to speak to other co-workers and to ask them to charge machines at night. Tool box talk
3	Signing in book to be used everyday	Supervisor to talk to all operatives to ensure they

Table 2: Meaningful discussion with actions taken to resolve issues and their ranking